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EFFECT OF SOCIAL PRESSURE ON CONCEPT IDENTIFICATION.

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DESCRIPTORS- *SOCIAL INFLUENCES, *FEEDBACK, *CONCEPT FORMATION, *TRANSFER OF TRAINING, LEARNING PROCESSES, COGNITIVE PROCESSES,

ABOUT 70 FEMALE UNIVERSITY STUDENTS PARTICIPATED IN THIS INVESTIGATION OF THE EFFECT OF SOCIAL PRESSURE ON CONCEPT IDENTIFICATION TASKS AND ITS TRANSFER EFFECT FROM ONE TASK TO ANOTHER. THE SUBJECTS WERE RANDOMLY ASSIGNED TO FIVE EXPERIMENTAL GROUPS -- (1) A CONTROL GROUP WITHOUT FEEDBACK, (2) A VERIDICAL GROUP WITH CORRECT FEEDBACK ON THE TWO TASKS REQUIRED, (3) A NONVERIDICAL GROUP WITH INCORRECT FEEDBACK ON BOTH TASKS, (4) A VERIDICAL-NONVERIDICAL GROUP WITH CORRECT FEEDBACK ON ONE TASK AND INCORRECT FEEDBACK ON THE OTHER, AND (5) A NONVERIDICAL-VERIDICAL GROUP WITH A REVERSE FEEDBACK SITUATION. SOCIAL PRESSURE TOOK THE FORM OF UNANIMOUS CORRECT OR INCORRECT FEEDBACK WHICH THE SUBJECTS BELIEVED WAS THE RESPONSES OF PEERS, BUT WHICH ACTUALLY WAS PRODUCED BY THE MANIPULATIONS OF A SPECIAL APPARATUS. RESULTS SHOWED THAT THE VERIDICAL GROUP FEEDBACK FACILITATED CONCEPT ACQUISITION, WHILE THE NONVERIDICAL GROUP FEEDBACK PRODUCED A NEGATIVE EFFECT. TRANSFER EFFECT BETWEEN THE TWO TASKS RESULTED IN A POORER PERFORMANCE ON THE SECOND TASK. (NS)

EFFECT OF SOCIAL PRESSURE ON CONCEPT IDENTIFICATION

WISCONSIN RESEARCH AND DEVELOPMENT

CENTER FOR COGNITIVE LEARNING

RESEARCH AND DEVELOPMENT

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EFFECT OF SOCIAL PRESSURE ON CONCEPT IDENTIFICATION

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PREFACE

One major program of the Wisconsin R and D Center for Cognitive Learning is Program 1 which is concerned with fundamental conditions and processes of learning. This Program consists of laboratory-type research projects, each independently concentrating on certain basic organismic or situational determinants of cognitive learning, but all united in the task of providing knowledge which can be effectively utilized in the construction of instructional systems for tomorrow's schools.

Any complete study of the variables which influence human learning—whether in or out of the classroom—must ultimately consider social influences. Professor Allen and his associates are actively engaged in a research project directed toward the analysis of social determinants in the acquisition and retention of basic cognitive skills.

In this experiment Professor Allen examined the effect of unanimously correct versus unanimously incorrect manipulated feedback from an aggregate of college peers presumably attempting to solve the same concept identification problem. The results not only clearly indicated the facilitative effect of veridical feedback and the deleterious effect of nonveridical feedback, but transfer data revealed a persistent reliance upon the initial accuracy of the social group.

Harold J. Fletcher
Director, Program 1

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ABSTRACT

This study investigated the effect of veridical and nonveridical group feedback on concept identification, and the transfer of the effect of such social pressure from one problem to a second one. Social pressure consisted of a group of Ss giving either unanimously correct or incorrect responses over a series of trials. To study transfer of the social pressure effect, in one condition the group gave veridical feedback on the first problem and nonveridical feedback on the second; the opposite order of feedback was given in another condition. Results showed that veridical group feedback facilitated concept acquisition and that nonveridical feedback depressed acquisition. Moreover, transfer of the social pressure effect occurred between the two problems, resulting in poorer performance on the second problem.

I
INTRODUCTION

Research during the past decade has shown conclusively that social pressure from a group influences individual behavior on a variety of simple judgmental tasks, e.g., perceptual discrimination (Allen, 1965). Yet little research has been directed toward investigating the possible role of social pressure in more complex cognitive processes such as learning and remembering. Social psychologists tend to consider the nature of the task unimportant or irrelevant in comparison to the basic psychological processes under investigation. Thus, a task is often employed solely because it is simple and available; many such tasks no doubt tap only simple psychological processes. Because of this emphasis on processes rather than tasks, the study of social pressure has largely neglected the investigation of complex cognitive behavior.

Our knowledge concerning the effects of social pressure on behavior indicates that the complex cognitive processes of learning and remembering might be particularly vulnerable to social influence at certain stages of learning. For example, the literature on social pressure shows that effects of the group are more pronounced when the task is ambiguous (Luchins, 1945; Walker and Heyns, 1962) or when the person has little confidence in his ability to make a correct response (Hochbaum, 1954; Wiener, 1958). During the initial phases of the learning process the task is quite ambiguous to the S, and his confidence in his ability to respond correctly is low. At this stage, it is very likely that social pressure would exert a strong influence on learning; the effect of such social pressure could, of course, aid or hinder the speed of learning, depending on the objective correctness or incorrectness of the group's response.

Little research has been conducted on the effect of social pressure on learning and remembering. Allen and Bragg (1967) showed that social pressure influences memory on a paired-associate learning task. One study of acquisition (Rhine, 1960) employed a very simple learning situation in which Ss were asked to predict whether a "little known" group of people possessed each of a series of desirable and undesirable traits. Results showed that peer-group responses aided acquisition on this simple task. In view of the meager systematic data available, the first purpose of the present study was to explore the effect of social pressure during the acquisition phase of learning. Social pressure is presented in the present study in the form of unanimous (correct or incorrect) feedback from a group of S's peers. In order to avoid the limitations of the simple rote learning situation, the concept identification task was chosen for use in this study.

A second purpose of the present study was to investigate transfer of the effect of social pressure from one problem to another. Insufficient attention has been devoted to the potential sequential effects of group pressure. A few studies have addressed themselves to the problem in a very limited way by examining between-trial effects of social pressure on a single task. One study found a carry-over of social pressure between trials on perceptual judgments of numerosity of a pattern of dots (Fisher, Rubenstein, and Freeman, 1966). In this study a confederate consistently gave estimates higher than the S's estimates. Not only was the S influenced by the confederate's response to the same stimulus, but the S's initial response on the next stimulus display—given prior to the confederate's estimate—was also affected. That is, between-trial influence as well as within-trial influence was demonstrated. In a subsequent study, Peterson, Saltzstein and Ebbe (1967), again using numerical estimates of dots, found between-trial influence when the stooge changed his response each trial in order to maintain a constant discrepancy from S's preceding estimate. But when the stooge maintained a fixed absolute estimate, no between-trial influence was observed.

Relevant to the question of sequential ef-

fects of group pressure is Hollander's (1960) research, indicating that tolerance of an individual's deviation from the group is a function of his earlier behavior in relation to the group. Greater acceptance of an individual's attempt to change the group norm was shown when the individual's conformity to the group occurred in the earlier stages of interaction, rather than at later stages.

When the direction of the group's response changes over time, sequential effects become crucial; the possibility of transfer effects from one task to another then arises. A task having an objectively correct answer, such as the concept attainment task, would appear to possess distinct advantages for studying transfer effects of group pressure. Use of such a task allows us to shed some light on the question of appropriateness or efficiency of conformity and nonconformity. Much controversy exists concerning whether conformity to the group should be considered desirable or undesirable behavior. Under certain circumstances, conformity to a group is undoubtedly a very adaptive or appropriate response. To agree with a group that gives veridical or objectively correct responses in a concept identification task, and to depend upon the group when one is uncertain, would facilitate learning. By contrast, if the group's responses were nonveridical or incorrect, to agree because of social pressure is clearly inefficient since it would interfere with learning. The study of transfer effects of group pressure has been neglected, but the phenomenon attains considerable importance when dealing with objective tasks.

Social reality is complex; the behavior of a group does not always remain consistent over time. Agreement with a group is therefore advantageous to the individual in some circumstances and disadvantageous in others. Consider the responses of a group on a concept identification task. As pointed out earlier, agreement with the group would facilitate identification of the concept if the group supplied correct responses. Suppose that the group's responses were initially correct, and that the S came to rely on the group. If the same group later began giving incorrect responses, the S's continued reliance on the group would hinder learning by delaying prompt adaptation to the new situation. Negative transfer effects of two types are therefore possible: (1) initial conformity to a correct group, followed by later conformity to the same group now giving incorrect responses, (2) initial nonconformity to an incorrect group, followed by nonconformity to the group now giving correct responses.

Ideally, an individual's behavior would consist of a high degree of selectivity in relation to the group. Because the group's response is subject to change, selective dependence, rather than rigid conformity or nonconformity, is most advantageous to the individual. Therefore, the most efficient relation of the individual to the group is conformity when the group is correct and nonconformity when the group is incorrect.

In summary, the purposes of this study are twofold: first, to investigate the effect of social pressure on concept identification; and second, to study the transfer of the social pressure effect from one task to another.

II
METHOD

SUBJECTS

Subjects for the study were 73 female freshman and sophomore university students. The Ss volunteered to participate in the experiment without compensation of any kind. The Ss were randomly assigned to the five experimental conditions.

APPARATUS

The apparatus, a Crutchfield (1955) electric signaling device used in conformity research, consists of five booths containing nine response switches and a matrix of 45 signal lights showing the answers given by the five Ss. Modification of the apparatus by relabeling switches permitted its use in the concept attainment task. The S is led to believe that she responds last in a group of five, and that other persons' responses are shown in each booth. In actuality, all five Ss answer in the last position, and the signal lights shown in each S's booth are controlled by E from another room. In this way, all Ss are exposed to the same pattern of group pressure, and stooges are unnecessary. Five Ss were always tested together.

MATERIAL

The learning task consisted of slides containing various geometric designs. The slides were projected on a screen 10 feet in front of the Ss. Five dimensions, varying on two attributes, were used in the concept attainment task. The dimensions were: (1) size—large or small, (2) shape—square or circle, (3) color—red or green, (4) number—one or two, and (5) texture—plain or textured.

INSTRUCTIONS

The Ss were told that their task was to solve a concept identification problem. A slide containing all five dimensions was first shown and the dimensions were described. The Ss were told that the concept to be identified would consist of one or a combination of the dimensions present in each slide. The S's task was to determine whether or not a slide contained the concept and to identify the relevant dimensions.

The S was further told in the instructions:

> If you think that the slide does contain the concept, you should turn on switch number one marked "contains concept." If you think that the slide does not contain the concept, turn on switch number two marked "does not contain concept." If you have decided the slide contains the concept, then I want you to turn on one or more of the five switches which indicates the relevant or correct dimension. For example, if on this slide you believed that the correct concept was "small green circle," you would first turn on switch number one, then the switches corresponding to size, color, and shape (switches 5, 6, and 7). If you thought that this slide did not contain the concept, and therefore turned on switch number two, I want you to turn on the switch or switches for the dimension or dimensions that are incorrect. For example, if you thought that the concept was "small red circle" (instead of "small green circle"), then the incorrect dimension would be color and you would turn on the switch corresponding to color (switch number 5). After you all have answered, I will tell you if the slide contained or did not contain the concept. Then we will go on to the next slide.

Five practice trials were given, followed by 25 test trials in each of the two series of trials. In the group conditions, Ss were assigned a position for responding and always answered

in order. When the experiment began, all Ss, unknowingly, were assigned to the last position, number five. This allowed the E to control the simulated responses observed by S prior to her answering. The first practice slide was always an example of the concept ("red-textured" for the first series, and "small" for the second series).

In summary, the Ss responded by pressing one switch to indicate that a slide contained the concept, or a second switch to indicate that the slide did not contain the concept. One or more of five other switches in S's booth, labeled by dimension (color, shape, etc.), were used by S to indicate correct dimensions if the slide contained the concept or to indicate incorrect dimensions if the slide did not contain the concept. After each trial, E reported whether or not the slide contained the concept, but he did not give information concerning the correctness of the dimensions comprising the concept.

DESIGN

The five conditions used in the study are described below. In each condition the Ss received two concept identification problems, each problem consisting of a series of 25 trials.

(1) Control: In the control condition, Ss learned the two concept attainment tasks without seeing the other four Ss' answers to the 25 slides in each series. Twenty-one Ss were used in this condition.

(2) Veridical: In this condition, the feedback received by Ss was mostly correct for each of the two concept attainment tasks. On the first 12 slides of the first series of 25 trials, there was some disagreement shown among the simulated Ss in order to increase credibility of the situation. But after the 12th slide the simulated Ss appeared unanimously to choose the correct concept, and adhered to the concept for the remainder of the series. The same sequence of trials was used for supplying feedback in conditions four and five below. Fifteen Ss were used in this condition.

(3) Nonveridical: The responses of others that the Ss observed in this condition were incorrect on both problems. On the first 12 slides there was disagreement shown by the simulated Ss in their incorrect responses. But subsequent to slide 12 all Ss agreed on the concept, giving identical wrong answers for each slide. The same sequence of incorrect trials was used for incorrect feedback in conditions four and five below. Thirteen Ss were used in this condition.

(4) Veridical-nonveridical: In this condition Ss received unanimously correct feedback from the group on the series of 25 trials comprising the first problem, and unanimously incorrect group feedback on the second 25 trials for the second problem. Eleven Ss were used in this condition.

(5) Nonveridical-veridical: In this condition Ss received incorrect group feedback on the first problem, but correct group feedback on the second problem. Thirteen Ss were used in this condition.

III
RESULTS

The most straightforward overall analysis of the data consists of calculating the percentage of Ss in each feedback condition who correctly identified the concept used in the two problems by the end of each series of 25 trials. For this analysis data were combined for the two veridical feedback conditions, and for the two nonveridical conditions.

The first column of Table 1 presents results for the first concept identification problem. Data in Table 1 show that on the first task 88 percent of Ss in the veridical feedback condition correctly identified the concept, as compared with 23 percent in the nonveridical feedback condition. The difference between the veridical and nonveridical feedback conditions was statistically significant at less than the .01 level ($\chi^2 = 21.98$, df = 1). In the control condition, where the S could not observe other persons' responses, 43 percent of the Ss identified the concept. In the veridical feedback condition Ss' performance was significantly better than in the control condition ($\chi^2 = 11.11$, df = 1, $p < .01$); but the decrease in performance of Ss in the nonveridical feedback condition, relative to the control, was not statistically significant ($\chi^2 = 2.09$, $p < .20$).

Results for the second concept identification problem were congruent with results for the first problem. It can be seen in the second column of Table 1 that veridical feedback from the group improved performance while nonveridical feedback depressed performance. In the veridical feedback condition, 79 percent of the Ss correctly identified the concept, as compared with only 12 percent in the nonveridical condition. Results for the control condition fell between the two experimental conditions (43 percent). The difference between the veridical and nonveridical feedback conditions was statistically significant at less than the .01 level ($\chi^2 = 22.59$, df = 1). In addition, scores in the veridical feedback condition were significantly better than in the control condition ($\chi^2 = 6.58$, df = 1, $p < .02$), and scores in the nonveridical feedback condition were significantly poorer than in the control condition ($\chi^2 = 4.56$, df = 1, $p < .05$).

Table 1

Percentage of Subjects in Each Condition Who Correctly Identified the Concept on the First and Second Problem

Condition	First problem	Second problem
Control	43	43
Veridical feedback	88	79
Nonveridical feedback	23	12

In summary, the highly significant differences observed as a function of type of group feedback indicate that social pressure affected concept attainment, with veridical group responses facilitating performance and nonveridical responses interfering with performance.

A second problem of interest in this study was the transfer of the group's effect on concept attainment from the first task to the second one. Recall that in the veridical-nonveridical condition, the group gave correct responses on the first task, but incorrect answers on the second task. The opposite inconsistent order of group feedback was followed in the nonveridical-veridical condition. The remaining two experimental conditions, in which the direction of the group's responses remained consistent across the two problems, provided a baseline against which transfer of the group's inconsistent feedback across problems could be assessed.

Results showed that transfer effects were clearly evident. Data were first examined for the two groups that received veridical feedback on the second task. Feedback in one of these conditions (veridical) was also correct on the first task, but in the other condition (nonveridi-

cal-veridical) feedback was incorrect on the first task. We would predict that transfer of the effects of incorrect group feedback given on the first task would detrimentally affect concept learning on the second task; in other words, negative transfer should occur. Results showed that the mean trial on which the concept was correctly identified when both tasks received veridical group feedback was 15.2, as compared with 17.7 when the first task had received nonveridical group feedback. The difference between the two conditions was significant at beyond the .05 level of confidence by the one-tail t test ($t = 1.98$, $df = 21$).

To measure the transfer effect of veridical group feedback when the second task received incorrect feedback, it was necessary to analyze the data somewhat differently. Using the mean trial on which the concept was attained was not feasible because so few Ss correctly identified the concept when incorrect feedback was given on the second task. Therefore, as an index of the transfer effect the mean number of times Ss agreed with the incorrect responses of the group on the second task was used. Performance on the second task for the group receiving nonveridical feedback was then analyzed as a function of whether the group's feedback had been veridical or nonveridical on the first task. We predicted that agreement with the group's incorrect responses on the second task would be higher when feedback from the group on the first task had been correct than when group feedback on the first task had been incorrect. Results supported the prediction: the mean number of trials on which Ss agreed with the incorrect responses of the group on the second task was 11.5 for the veridical-nonveridical condition, as compared with a mean of 7.5 for the nonveridical condition. The difference between the two conditions was significant at the .05 level by a one-tail t test ($t = 1.82$, $df = 19$).

IV
DISCUSSION

Results of the present study have shown that social pressure, in the form of unanimous responses of a group of peers, significantly affects behavior on a concept identification problem. The strength of the effect of social pressure on concept acquisition appears to be asymmetrical. Interestingly and, perhaps encouragingly, the amount of the facilitating effect of social pressure in the form of veridical group feedback was approximately twice as great as the amount of the detrimental effect due to nonveridical group feedback. The greater effect of correct feedback than of incorrect feedback is in accord with a study by Jones, Wells, and Torrey (1958), in which the E provided objective feedback to the group.

It should be emphasized that the amount of facilitation of concept acquisition attributable to veridical group feedback was not insubstantial. In the veridical feedback condition 89 percent of the Ss accurately identified the concept as compared with 43 percent in the control condition, an advantage of 46 percent attributable to the group's feedback.

Whether the effect of social pressure was due to mere public agreement with the group or to the individual's true belief is difficult to determine with certainty. The problem-solving situation is one that would primarily tap informational rather than normative social influence (Deutsch and Gerard, 1955). That is, agreement with the group was probably due to the S's using the responses of other persons as reliable sources of information about a solution to the problem, rather than to an attempt on the S's part to gain approval or avoid disapproval from the other group members. Instructions concerning the experiment and the nature of the task both served to orient the Ss toward utilizing other members of the group as informational rather than normative sources of influence. So it is very plausible to interpret the influence of the group as being due primarily to informational influence, and not to mere public compliance to the group.

It is interesting that although the task was equally unfamiliar to all group members, the Ss were willing often to agree with the answers given by the group. No doubt such agreement served to reduce the Ss' motivation to search for the solution to the concept identification problem. Unanimity among a group of persons often means that their responses are correct; initial acceptance of such an assumption probably led Ss to place undue dependence on the group. Agreement with an apparently self-confident group could have caused a decrease in cognitive arousal on the part of the Ss. As a consequence, the Ss probably relaxed somewhat and exerted less cognitive effort in finding the solution to the problem. Such relaxation is perhaps also partially due to Ss' acquiring a "set" of agreeing with the group which is difficult to break. Like Ss in Luchin's (1942) water-jar problem, once the set is established, a new and critical analysis of the problem is accomplished slowly and with difficulty. The cognitive set to agree with the group can sometimes clearly aid Ss' problem-solving attempts or equally often serve as a barrier, depending on the degree of veridicality of the group's responses.

Evidence of transfer of the group's effect on concept acquisition from the first to the second task is a very intriguing finding. When the group had previously given correct responses on the first task, Ss were likely to continue agreeing with the group on the second task, although the group now gave incorrect responses. Conformity to the group at this time was inappropriate because the group's behavior was inconsistent with its previous veridical responses. Similarly, Ss were unnecessarily inefficient when the group had given incorrect responses on the first problem, but changed to supplying correct answers on the second; in this case, Ss conformed less than was warranted by the group's veridical answers given at that time.

The answer to the value question of whether

conformity is desirable or undesirable obviously is shown in this study to depend on the specific characteristics of the situation. Appropriate and efficient behavior would consist of an individual's conforming to a group sometimes on some issues, and disagreeing at other times on other issues. The difficulty of increasing selective response to group pressure is, however, very real. The tendency is strong to respond consistently to a group (or person or situation), even though rational analysis would dictate a change in response. The transfer phenomenon observed in the present experiment appears to be a special case of a more general psychological phenomenon found in other contexts. For example, the halo effect observed in prestige suggestion is a case of behaving consistently toward an individual across situations, though a change in behavior would be the more reasonable response (Aronson and Golden, 1962). A source having high prestige on one topic tends to produce unwarranted agreement on another topic on which he has little competence; similarly, a source having low prestige on one topic often produces lower agreement than warranted on a second topic on which he has some competence.

Transfer effects of the type found in the present experiment are probably not uncommon in everyday social behavior, but the problem remains to be systematically explored in future research.

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